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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,701	12/01/2004	Tatsuya Kato	890050.514USPC	6724

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EXAMINER	
RIVERO, MINERVA	

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/516,701	KATO ET AL.	
	Examiner	Art Unit	
	Minerva Rivero	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 5-6, 12-13, 15, 18, 21 and 22 are rejected under 35 U.S.C. 103(a) as being anticipated by Lee *et al.* (US Patent 6,404,712), in view of Koishi *et al.* (US Patent 6,611,481).

4. Regarding claims 1 and 12, Lee *et al.* disclose an apparatus and a method for recording data in an optical recording medium comprising steps of projecting a laser beam whose power level is modulated in accordance with a pulse train pattern including a pulse whose level is set to a level corresponding to a level of a recording power set to

be higher than a reproducing power and a pulse whose level is set to a level corresponding to a level of a bottom power set to be higher than the reproducing power onto a write-once optical recording medium to record a test signal in the optical recording medium, reproducing the test signal and determining an optimum level of the recording power based on the thus reproduced test signal (*recording pulse-width modulated data*, Col. 2, Lines 32-34; *write-once CD*, Col. 4, Lines 33-35; *recording test data using varying power levels*, Col. 3, Lines 2-9 and 20-26; *detecting the optimal writing power while reproducing the test data and examining its quality*, Col. 2, Lines 13-19; Fig. 8, steps 11 and 24).

However, Lee *et al.* do not disclose but Koishi *et al.* do disclose determining an optimum level of the bottom power based on the thus reproduced test signal (Col. 6, Lines 39-42; *increasing a bias power level by one unit if jitter is exceeds a reference value*, *correcting a write power by increasing a bias power level*, Col. 14, Lines 41-48 and 62-67; Fig. 5, steps 54 and 56).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Koishi *et al.* by determining an optimum level of the bottom power based on the thus reproduced signal, in order to optimize a bottom power level since the bottom power is a component of the writing pulse and therefore contributes to an optimum recording.

5. Regarding claim 18, Lee *et al.* disclose an optical recording medium comprising a substrate and at least one recording layer disposed on the substrate and being

constituted so that data are recorded by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels corresponding to a recording power and a first bottom power onto the at least one recording layer to form a recording mark in the at least one recording layer, the optical recording medium being recorded with modulation pattern setting data for setting a pulse train pattern used for modulating a power of the laser beam, determining pulse train patterns by fixing the bottom power of the laser beam in accordance with the pulse train patterns to record test signals in the optical recording medium, reproducing the second test signals and determining the optimum level of the recording power based on the thus reproduced second test signals (*recording pulse-width modulated data*, Col. 2, Lines 32-34; *write-once CD*, Col. 4, Lines 33-35; *recording test data using varying power levels*, Col. 3, Lines 2-9 and 20-26; *detecting the optimal writing power while reproducing the test data and examining its quality*, Col. 2, Lines 13-19; Fig. 8, steps 11 and 24).

However, Lee *et al.* do not disclose said modulation pattern setting data are produced by determining pulse train patterns by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals (Col. 6, Lines 39-42; *increasing a bias power level by one unit if jitter is exceeds a reference*

value, correcting a write power by increasing a bias power level, Col. 14, Lines 41-48 and 62-67; Fig. 5, steps 54 and 56).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Koishi *et al.* by having said modulation pattern setting data are produced by determining pulse train patterns by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals, in order to optimize a bottom power level since the bottom power is a component of the writing pulse and therefore contributes to an optimum recording.

6. Regarding claims 2 and13, Lee *et al.* do not explicitly disclose but Koishi *et al.* do disclose determining pulse train pattern by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals (*iteratively lowering or increasing a bias power level by one unit, measuring respective jitter and bit error rate and determining an optimum power level of the pulse*, Col. 14, Lines 41-48 and 62-67; Col. 15, Lines 19-27).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Koishi *et al.* by determining pulse train pattern by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals, as disclosed by Koishi *et al.*, in order to optimize a bottom power level since the bottom power is a component of the writing pulse and therefore contributes to an optimum recording.

7. Regarding claims 5 and 15, Lee *et al.* further disclose determining train pulse patterns by fixing the bottom power at the optimum level and varying the level of the recording power, modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test signals and determining the optimum level of the recording power based on the thus reproduced second test signals (*recording pulse-width modulated data*, Col. 2, Lines 32-34; *write-once CD*, Col. 4, Lines 33-35; *recording test data using varying power levels*, Col. 3, Lines 2-9 and 20-26; *detecting the optimal writing power while reproducing the test data and examining its quality*, Col. 2, Lines 13-19; Fig. 8, steps 11 and 24).

8. Regarding claims 6 and 21, Lee *et al.* further disclose the optimum level of the recording power is determined based on at least one of jitter and error rates of the reproduced second test signals (*examining jitter characteristic in order to determine the optimal recording power*, Col. 2, Lines 13-18).

9. Claims 3, 4, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* (US Patent 6,404,712), in view of Koishi *et al.* (US Patent 6,611,481), as applied to claims 2, 13 and 18 above, further in view of Finkelstein *et al.* (US Patent 5,185,733).

Regarding claims 3, 4 and 14 and 20, the combined teachings of Lee *et al.* and Koishi *et al.* do not explicitly disclose but Finkelstein *et al.* do disclose the optimum level of the bottom power is determined as a level of the bottom power when the amplitude of the reproduced first test signal becomes maximum (*setting laser power level for which the readback signal amplitude is maximal*, Col. 9, Lines 59-61).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the combined teachings of Lee *et al.* and Koishi *et al.* and determine the optimum level of the bottom power as a level of the bottom power when the amplitude of the reproduced first test signal becomes maximum, as disclosed by Finkelstein *et al.*, since using the laser power level represented by the maximum signal amplitude provides an optimum recording laser

power level for ensuring precise and faithful digital recording, as further disclosed by Finkelstein *et al.* (Col. 5, Lines 14-19).

10. Claims 7-8, 16-17 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* (US Patent 6,404,712), in view of Koishi *et al.* (US Patent 6,611,481), as applied to claims 2, 13 and 18 above, further in view of Takada *et al.* (US Patent 5,818,808).

11. Regarding claims 7, 16, 22 Lee *et al.* disclose the modulation pattern setting data are produced by determining pulse train patterns by fixing the level of the bottom power, varying the level of the recording power modulating the power of the laser beam in accordance with the pulse train patterns to record second test signals in the optical recording medium, reproducing the second test signals, and tentatively determining the optimum level of the recording power based on the thus reproduced second test signals (*recording test data using a range of varying writing powers*, Col. 3, Lines 2-9 and 20-27; Fig. 8, steps 11 and 24).

However Lee *et al.* do not explicitly disclose but Koishi *et al.* do disclose determining pulse train patterns by fixing the recording power at the tentatively determined optimum level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and

determining the optimum level of the bottom power based on the thus reproduced first test signals (*iteratively lowering or increasing a bias power level by one unit, measuring respective jitter and bit error rate and determining an optimum power level of the pulse*, Col. 14, Lines 41-48 and 62-67; Col. 15, Lines 19-27; Fig. 5 and Fig. 4(a)).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Koishi *et al.* by determining pulse train pattern by fixing the recording power at a predetermined level and varying the level of the bottom power, modulating the power of the laser beam in accordance with the pulse train patterns to record first test signals in the optical recording medium, reproducing the first test signals and determining the optimum level of the bottom power based on the thus reproduced first test signals, as disclosed by Koishi *et al.*, in order to optimize a bottom power level since an off-duty pulse having a bottom power is a component of the writing pulse train and optimizing said bottom power will contribute to an optimum recording.

Moreover, Lee *et al.* do not explicitly disclose but Takada *et al.* do disclose fixing the level of the bottom power at a level substantially equal to the level of the reproducing power (*bias power level within a 0.5 mW range of the reproducing power level*, Col. 12, Lines 59-60; *bias power level remained constant at 8 mW, while writing power level varied between 14 and 15 mW*, Col. 28, Lines 2-4; Col. 29, Lines 1-2; see Table 1).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the combined teachings of Lee *et al.* and Koishi *et*

al. by fixing the level of the bottom power at a level substantially equal to the level of the reproducing power, since it is common practice in the art to have a bias power level that is substantially equal to a reproducing power level, and in order to evaluate a test signal solely based on recording power level variations.

12. Regarding claim 17, Lee *et al.* further disclose the optimum level of the recording power is determined based on at least one of jitter and error rates of the reproduced second test signals (*examining jitter characteristic in order to determine the optimal recording power*, Col. 2, Lines 13-18).

13. Regarding claim 23, Lee *et al.* further disclose the optimum level of the recording power is determined based on at least one of jitter and error rates of the reproduced second test signals (*examining jitter characteristic in order to determine the optimal recording power*, Col. 2, Lines 13-18).

14. Regarding claim 8, Lee *et al.* further disclose the optimum level of the recording power is tentatively determined based on at least one of jitter and error rates of the reproduced second test signals (*examining jitter characteristic in order to determine the optimal recording power*, Col. 2, Lines 13-18; Fig. 8).

15. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* (US Patent 6,404,712), in view of Koishi *et al.* (US Patent 6,611,481), further in view of Hintz (US Patent 5,458,941).

16. Regarding claims 9 and 19, the combined teachings of Lee *et al.* and Koishi *et al.* do not disclose but Hintz does disclose the optical recording medium further comprises a light transmission layer, and a first recording layer and a second recording layer formed between the substrate and the light transmission layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the first recording layer as a primary component and an element in the second recording layer as a primary component (Col. 4, Lines 6-11).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the combined teachings of Lee *et al.* and Koishi *et al.* and have the optical recording medium further comprise a light transmission layer, and a first recording layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the second recording layer as a primary component, as disclosed by Hintz, in order to effectively record marks in a multilayer optical disk.

17. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* (US Patent 6,404,712), in view of Koishi *et al.* (US Patent 6,611,481), as applied to claims 1 and 18 above, [redacted], further in view of Yasuda *et al.* (US 6,511,788).

18. Regarding claim 10, the combined teachings of Lee *et al.*, Koishi *et al.* [redacted] do not disclose but Yasuda *et al.* do disclose data are recorded in the optical recording medium by projecting a laser beam having a wavelength equal to or shorter than 450 nm thereonto (Col. 4, Lines 14-18).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to modify the combined teachings of Lee *et al.*, Koishi *et al.* [redacted], by having data recorded in the optical recording medium by projecting a laser beam having a wavelength equal to or shorter than 450 nm, since it enables a larger recording capacity, as further disclosed by Yasuda *et al.* (Col. 4, Lines 14-18).

19. Regarding claim 11, Yasuda *et al.* disclose the data are recorded in the optical recording medium by employing an objective lens and a laser beam whose numerical aperture NA and wavelength λ satisfy $\lambda/NA \leq 640$ nm [thus $NA/\lambda \geq 1.54$], and projecting the laser beam onto the optical recording medium via the objective lens ($NA/\lambda \geq 1.20$, Col. 9, Lines 41-42).

Therefore it would have been obvious to one ordinarily skilled in the art at the

time of the invention to modify the combined teachings of Lee *et al.*, Koishi *et al.* [redacted] by having the data recorded in the optical recording medium by employing an objective lens and a laser beam whose numerical aperture NA and wavelength λ satisfy λ/NA ≤ 640 nm, as disclosed by Yasuda *et al.*, since in order to raise a recording density a NA/λ ratio must be raised accordingly, as further disclosed by Yasuda *et al.* (Col. 10, Lines 6-7).

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ichihara *et al.* (US Patent 6,187,406) disclose an optical disk comprising phase change material.

Furumiya *et al.* (US Patent 6,791,926) disclose a method and device for finding conditions on recording pulse of an optical medium.

Yasuda *et al.* (US Patent 6,221,455) disclose a multi-layer optical disc with increased recording capacity.

Ueki *et al.* (US Patent 6,404,713) disclose a method and apparatus for optical recording wherein test signals are recorded to determine optimum recording parameters.

Hosoda *et al.* (US 2003/0228539) disclose a write-once including two recording layers wherein a stable amorphous state is reached by mixing components from each of the recording layers.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minerva Rivero whose telephone number is (571) 272-7626. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MR 3/18/06

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER